NEXRAD Product Improvement
Open Radar Data Acquisition (ORDA)
Configuration Management Plan (CMP)

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Section 1 - Introduction

Configuration Management (CM) as defined in the WSR-88D Configuration Management Plan (OSFPLN-SSB-03) is a process, which applies both technical and administrative direction and surveillance to:

(A) Identify and document the functional and physical configuration items (CIs) and computer program configuration items (CPCIs)

(B) Audit CIs and CPCIs to verify conformance to specifications, interface control documents, and other contract requirements

(C) Control change to CIs and CPCIs and their related documentation

(D) Record and report information needed to manage CIs and CPCIs effectively including the status of proposed changes and the implementation of approved changes

The purpose of this Configuration Management Plan (CMP) is to maintain the integrity of ORDA development, production and deployment for the duration of the ORDA project. ROC Program Branch is responsible for maintaining the WSR-88D system's product baseline. This CMP is subservient to the WSR-88D Configuration Management Plan (OSFPLN-SSB-03), and it will reference this plan where applicable in order to maintain consistency with established processes and procedures. This CMP consists of the following ten sections:

Section 1 - Introduction

Section 2 - Reference Documents

Section 3 - Organizations, Roles, and Responsibilities

Section 4 - Configuration Management

Section 5 - Data Management

Section 6 - Configuration Identification

Section 7 - Interface Management

Section 8 - Configuration Control

Section 9 - Configuration Status Accounting

Section 10 - Configuration Audits

Section2 - Reference Documents

NEXRAD Product Improvement (NPI) Project Plan (20 March 2000 revision)
WSR-88D Configuration Management Plan, OSFPLN-SSB-03

Technical Data Management Plan, ROCPLN-PGM-04
Meeting Minutes with ROC System Support Branch
Program Branch White Paper CM Process for the ORDA NPI Project
ORDA Documentation WPI (Documentation Procedures for ORDA Project)
WSR-88D Maintenance Concept
WSR-88D Integrated Logistics Support Plan
WSR-88D System Modification/Retrofit Management Plan, OSFPLN-SSB-02
ORDA Technical Manual Plan
CM Plan and CMII Rules published by Institute of Configuration Management
ANSI/EIA-649 Rev A
MIL-HDBK-61A (guidance only)

Section 3 - Organization, Roles, and Responsibilities

This section defines the organizations involved in the ORDA CMP, as well as their roles and responsibilities.

Reference the ORDA System Engineering Management Plan, OST-PLN-ORDA-001, for organizational relationships, additional roles, and additional responsibilities.

Government

For the purposes of this document the Government represents the Tri-Agencies (Department of Commerce, Department of Transportation, and the Department of Defense) and all their subordinate agencies.

RADAR Operations Center (ROC)

ROC will coordinate change proposal reviews and contributions with Tri-Agency participants using their existing process. The ROC Program Branch CM personnel will work closely with RSIS' CM personnel to release informal & formal baseline versions for requirements, specifications, programmatic documentation, and other progress reports mutually authorized by OST-SEC and RSIS' TP&M.

ROC will conduct the Functional Configuration and Physical Configuration Audits (FCA & PCA).

ROC will be responsible for creating the Product Baseline (PBL).

OST-SEC

OST-SEC will supervise the development and demonstration of all ORDA configuration items and computer program configuration items.

RSIS

For the purposes of this document, RSIS is the contractor.

RSIS will (1) lead the development of programmatic documentation, (2) lead integration testing during the Production Phase, (3) lead system support activities between Critical

Design Review approval and the end of deployment, and (4) lead procurement and deployment activities.

RSIS is responsible for content and version control of programmatic documentation until transition to the Government.

RSIS is responsible for maintaining the developmental baseline.

RSIS is responsible for new ORDA drawing version control during Prototype Phase, Production Phase, and Deployment Phase.

RSIS is responsible for version control of development tools, preliminary prototypes, production prototypes, and production. CIs and CPCIs utilized at the West Oaks facility for test bed set-up, test bed demonstration, product development, and product demonstration. Tools and prototypes include hardware and software.

RSIS will develop the CIs and CPCIs (1) using ROC's existing process or (2) using other development tools that are capable of synchronizing with ROC's existing processes.

RSIS will co-chair Functional Configuration Audit and Physical Configuration Audit.

RSIS is responsible for vendor adherence to this plan, the vendor Work Breakdown Structure, or the Vendor Statement of Work.

Vendors

For processes internal to Vendor, their own CMP will be implemented. SIGMET uses Revision Control Systems (RCS) for software CM. RCS includes a check-in, check-out procedure, and a version control feature. Hardware CM consists of two levels of control, every piece of hardware is labeled with the product name, (1) revision number, and (2) location.

The documentation hierarchy referenced to develop this plan is:

(1) OST-SEC, ROC CMT, and ORDA CM meeting minutes,
(2) WSR-88D Configuration Management Plan,
(3) WSR-88D System Modification/Retrofit Management Plan,
(4) Program Branch White Paper CM Process for the ORDA NPI Project,
(5) ORDA Documentation WPI, and
(6) Production-level ROC Work Practice Instructions and Design Practice Instructions
(7) Open Systems standards
(8) Technical Data Management Plan
(9) Applicable Military standards and industry standards

Section 4 – Configuration Management (CM)

This section includes a breakdown of the three ORDA CM phases. Also included is an overview of the ORDA CM Process, and 4 figures demonstrating a high level view of the ORDA CM process. Details of the ORDA CM process will follow in subsequent sections.

Phasing and Milestones

The three ORDA CM phases for the ORDA Project are (1) Prototype Phase, (2) Production Phase, and (3) Deployment Phase.

Prototype Phase

Within the Prototype Phases are the following design reviews: (1) Preliminary Design Review, (2) Critical Design Review, (3) Component Test Readiness Review, and (4) Integration Test Readiness Review.

Production Phase

Within the Production Phase are the following design reviews: (1) System Test Readiness Review, (2) Production Readiness Review, (3) Acceptance Test Readiness Review, and (4) Deployment Readiness Review.

Deployment Phase

Within the Deployment Phase are the following design reviews: (1) Site Acceptance.

ORDA CM Process

To reiterate, the ORDA CM process is to include configuration identification, configuration control, configuration auditing, and configuration documentation.

The following four figures give a high-level description of the ORDA CM Process.

Figure 1 illustrates how a typical Functional Baseline is processed.

Figure 2 illustrates how draft requirements and specifications are released as "Preliminary" in Agile coincident with the SDR, PDR, CDR, and TRR reviews.

Figure 3 illustrates how to baseline programmatic documents.

Figure 4 illustrates how the Product Baseline will be processed.

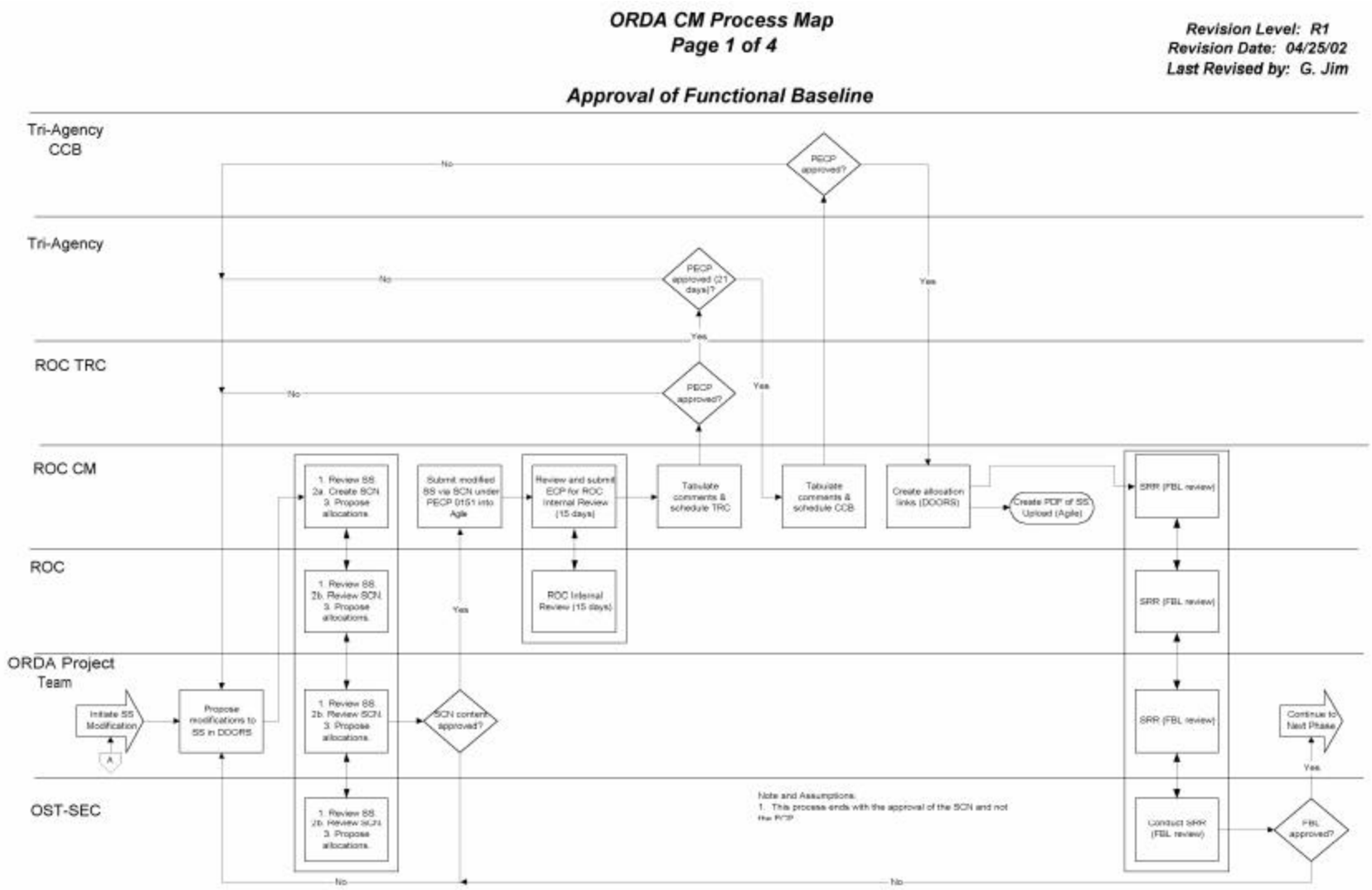


Figure 1. ORDA CM Process – Functional Baseline approval process.

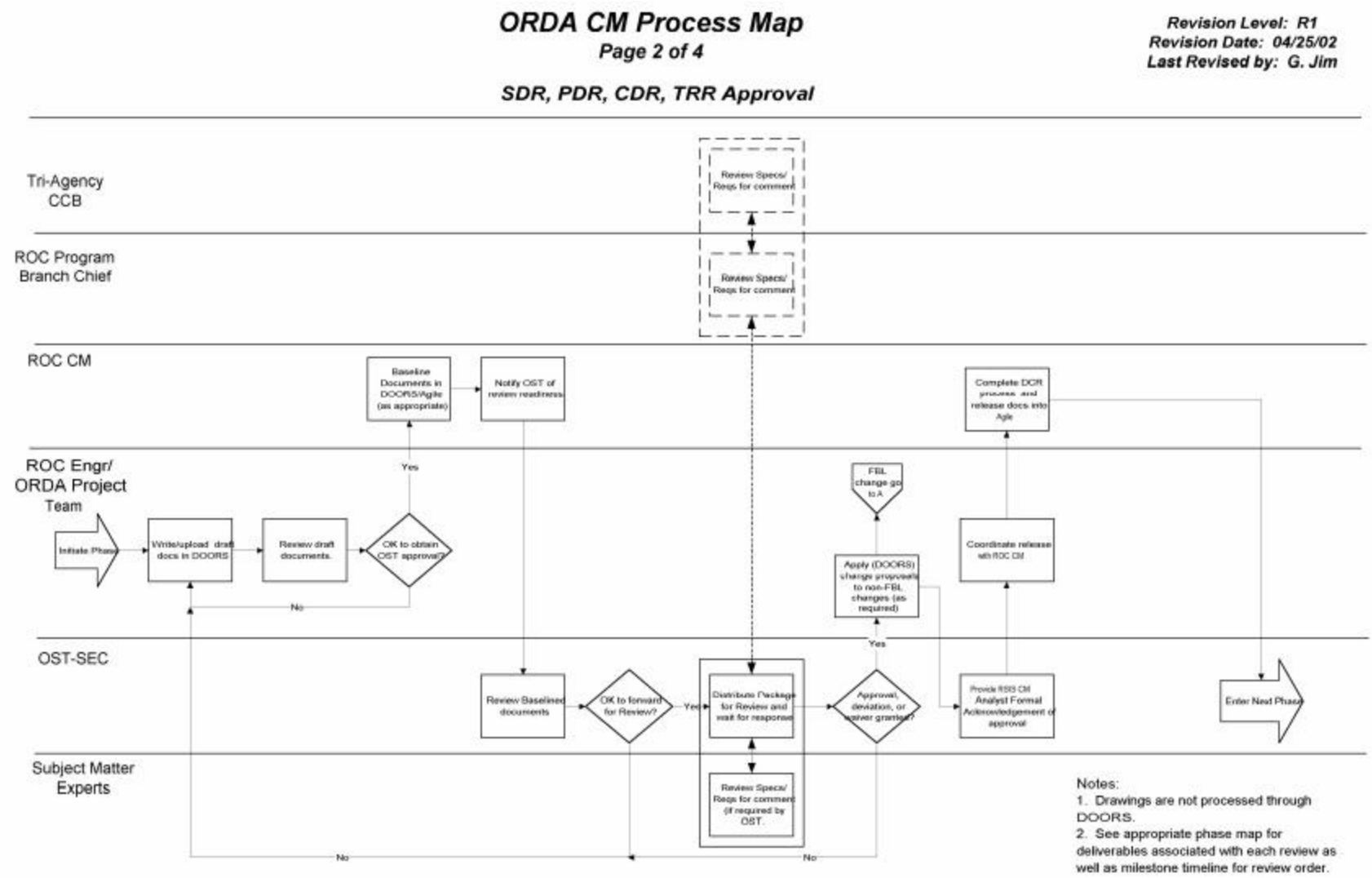


Figure 2. ORDA CM Process - draft Requirements & Specifications “Preliminary” release process.

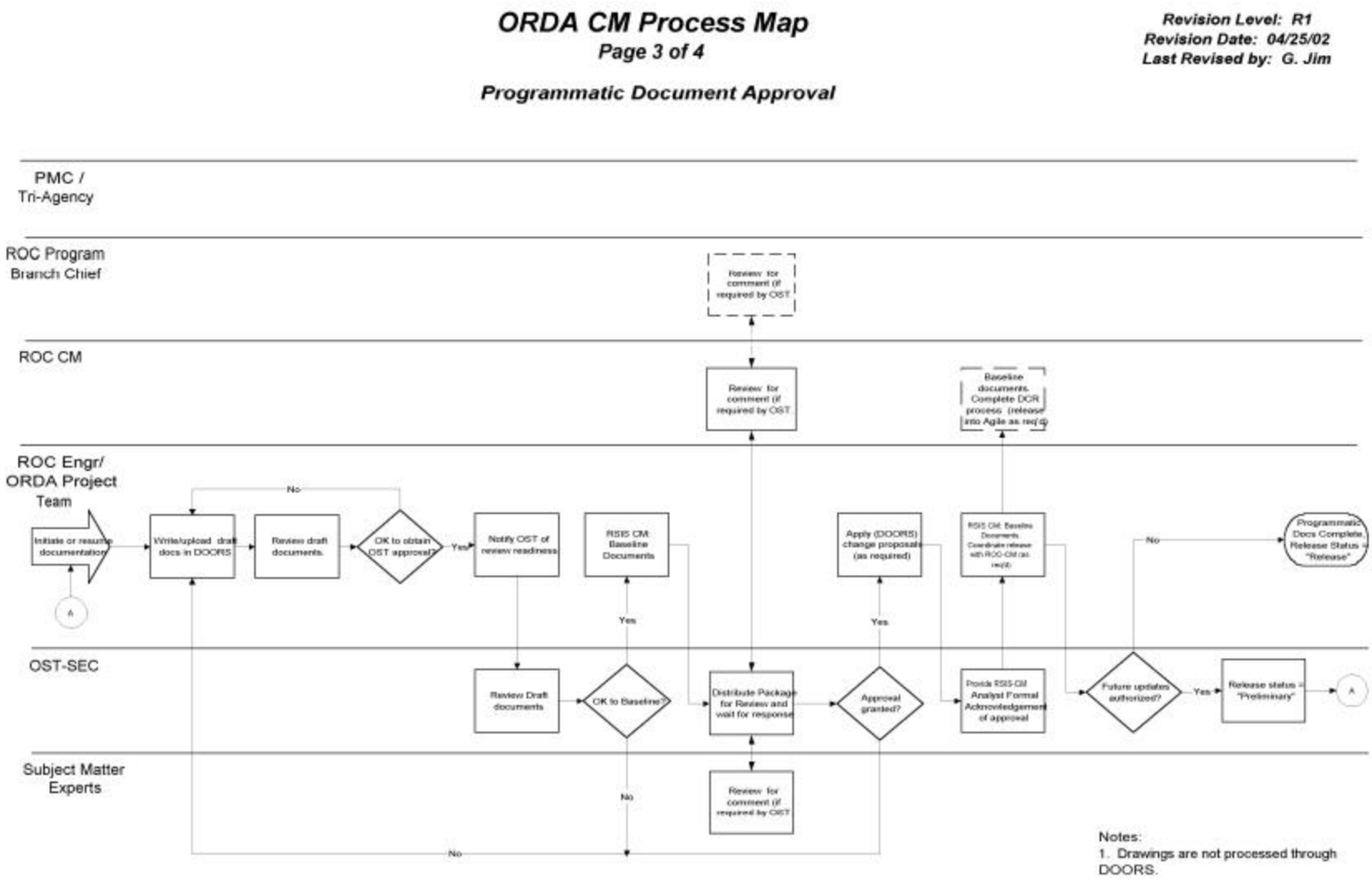


Figure 3. ORDA CM Process – Programmatic documentation “Release” process.

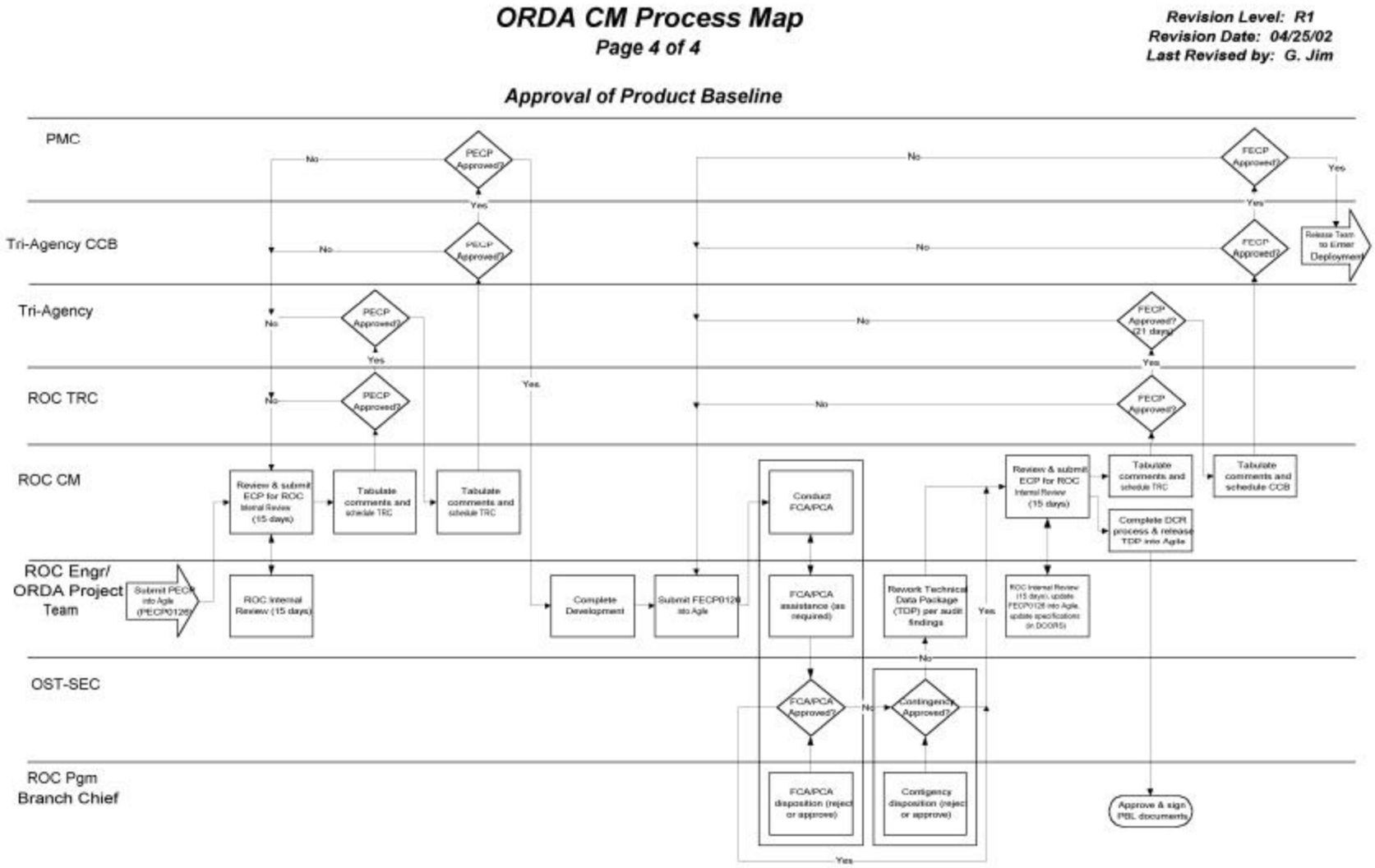


Figure 4. ORDA CM Process – Product Baseline approval process.

Section 5 - Data Management

The section of data management encompasses:

(1) what are the data requirements
(2) what is the data format,
(3) where the data will be stored, and
(4) how will the data be delivered.

Data Requirements

The ORDA project's data requirements will be identified according to the following hierarchy:

- Statement of Work (SOW),
  - Contract Data Requirements Listing (CDRL),
  - CDRL deadlines, and
- OST-SEC requests approved and assigned by RSIS TP&M Team

Data Format

For requirements, specifications, test documentation, and authorized programmatic documentation, the softcopy (data) format will be DOORS (Dynamic Object Oriented Requirements System) furnished by the Government.

For reports, charts, and presentations, the softcopy (data) format will be Microsoft Office suite furnished by the Government.

For drawings, the softcopy (data) format will be AutoCad or CADRA or PDF/TIF furnished by the Government.

For technical manuals, the softcopy (data) format is prescribed in the ORDA Technical Manual Plan (reference ORDA Technical Manual Plan).

The Government is responsible for generating PDF files for DOORS- and Microsoft Office-products.

For Software documentation the softcopy (data) format will be Doxygen. Version control format for software development will be CVS. Version control format for component, integration and system tests will be Razor.

Data Storage

(1) Editable requirement documentation, specification documentation, test documentation, and programmatic documentation will be stored in DOORS

(2) Change proposals will be stored in DOORS (the Government will have to transfer change proposals received from Agile to the DOORS change proposal system).

(3) PDF copies of requirement documentation, specification documentation, test documentation, all drawings, and programmatic documentation will be stored in Agile.

(4) Internal work practices, databases, presentations to the Government, and studies will be stored on a Government furnished network-drive.

(5) Technical manual and training material storage is prescribed in the ORDA Technical Manual Plan (reference ORDA Technical Manual Plan).

(6) Unit Tests will be stored in CVS and Razor.

(7) Anomaly reports will be stored in Razor furnished by the Government.

Data Delivery (Delivery Agents)

All data will be delivered to the Government as follows:

- Agile (Government will attach RSIS-supplied documents to the appropriate Agile file),
- DOORS,
- Softcopy delivery for required data items that are stored on a network drive and not stored on Agile or DOORS via labeled Compact Disk(s).
- Razor for software code

Section 6 - Configuration Identification

This section describes the Configuration identification process, delineated by hardware and software.

Configuration identification of hardware and software requirements documentation, specifications documentation, and test documentation will be assigned by ROC-CM.

Configuration identification of drawings will be assigned by ROC-CM.

Adding a suffix to the concomitant drawing number will create a parts list entry's configuration identification.

ROC Program Documentation Team will assign the configuration identification and Publication Change Request (PCR) for all technical manuals.

Configuration identification of training material will be assigned by TBD(Government).

RSIS will assign configuration identification for internal contractor documents to include work practice instructions, policies, and procedures. These documents will be tracked by using a database

Configuration identification of hardware (CIs) and software (CPCIs) architecture and products will be assigned by ROC.

Hardware

RSIS will create and maintain a database to identify, label, and track all Hardware (CIs).

Software

RSIS will create and maintain a database to identify, label, and track all Hardware (CPCIs).

Section 7 - Interface Management

ORDA interface management will adhere to "WSR-88D Configuration Management Plan." Interfaces will be managed according to the specific ICD (Interface Control Document). The ORDA interface management processes will include the following:

(1) WSR-88D Receiver Interface

(2) Remote RDA Control Interface

(3) WSR-88D Transmitter Interface

(4) FAA RMS Interface

(5) NWS Redundancy Interface

(6) FAA Redundancy Interface

(7) WSR-88D RPG Interface

- RSIS recognizes the complexity, transitional, and aggressive nature (a new build every 6 months) of this interface and will make extra efforts through communication and coordination with ROC CM to effectively manage this interface.

(8) Application Program Interface

Section 8 - Configuration Control

Configuration Control as defined in the WSR-88D CMP (OSFPLN-SSB-03) is the systematic proposal, justification, evaluation, coordination, approval or disapproval of proposed changes, and the implementation of approved changes to a CI/CPCI that is part of a formal configuration baseline.

ORDA configuration control focuses on documenting design change. The objectives for configuration control are:

- Repeatability of results today by the Government or their designated "Independent Verification & Validation" service provider,
- Reproducibility of past demonstrated results for future retest needs, and
- Responding proactively to design change

At a minimum, formal change requests submitted by RSIS will adhere to "WSR-88D Configuration Management Plan" and within the directives established by the Contract, Work Breakdown Structure (WBS), and Statement Of Work (SOW). The ORDA CM Process maps illustrates a model that includes the change process.

Repeatability & Reproducibility

What Changed

Version Control Systems maintain chronological repositories of changes to source code, tests, documentation and other project artifacts. Concurrent Versioning System (CVS) will be used by the software development team. During software development, each programmer will work on a personal "checked-out" copy of source code and artifacts. When changes are completed and unit tested, changed files will be "checked-in" to CVS. CVS will notify interested parties by e-mail for peer review and/or readiness for further test. The development repository will be located on a server that is accessible by project team members.

The source code and artifacts maintained in CVS during development will be baselined upon predetermined project milestones. The frequency of this "baselining" activity will be determined on a case-by-case basis. At a minimum, versions will be updated (snapshots of the repository will be taken) when an informal baseline is created for OST-SEC led external reviews. The need for version updates should be commensurate with risk, the number of activities directly affected or the degree of difficulty for cross-functional coordination. The final build will be stored and maintained by the ROC in Razor.

Why Did It Change

Justification for design changes (and even rejection of design changes) will be recorded. Justification will primarily focus on cost (technological constraints included), performance, and schedule.

When Did It Change

The (1) revision letter (or number), (2) effectivity (or release) date and, (3) at a minimum, approval signature by the engineer, Chief Engineer, and <TBD> will authorize the change release. These minimum three items will be prominently displayed at or near the beginning of the data item.

What Does The Change Affect

When possible, affected CIs, CPCIs, testing activities, product development activities, and external Government organizations outside of ROC will be identified. RSIS, ROC,

and OST-SEC will work together to establish communication between the appropriate Government organizations and ORDA product development and demonstration activities.

Responding

When To Respond

During development and demonstration activities, either the engineer or test engineer will decide the timetable (weekly reports will record the actions taken).

For external review, Agile will be the primary means of notification (and recording configuration changes).

Who Needs To Respond and How

During development and demonstration activities, either the engineer or test engineer will decide the best strategy and resources for development and problem solving (weekly reports will record the actions taken).

For external review, Agile will be the primary means of notification.

Programmatic Documentation control

This section will address the ORDA programmatic documents created by RSIS

Section 9 - Configuration Status Accounting (CSA)

CSA as defined in the WSR-88D CMP (OSFPLN-SSB-03} is the recording and reporting of information needed to effectively manage configuration. RSIS will document the configuration identification and determine the status of change proposals, deviations, and waivers with status accounting reports using MIL-HDBK-61A. The status accounting reports will be submitted to the government for approval in accordance with CDRL A030 and the SOW.

ORDA CSA will primarily use e-mail, DOORS, Agile, MS Project, MS Word, MS Excel, and MS Access to schedule, track, manage, and document configuration management activities and progress.

Figure 5 illustrates the data flow for ORDA requirements & specifications. The CSA is represented as a storage element.

Figure 6 illustrates the data flow for new ORDA drawings (and associate parts list). The CSA is represented as a storage element.

Figure 7 illustrates the data flow revising “Preliminary” released ORDA drawings and “Released” legacy drawings. The CSA is represented as a storage element.

Figure 5. ORDA CM Process data flow diagram for requirements & specifications.

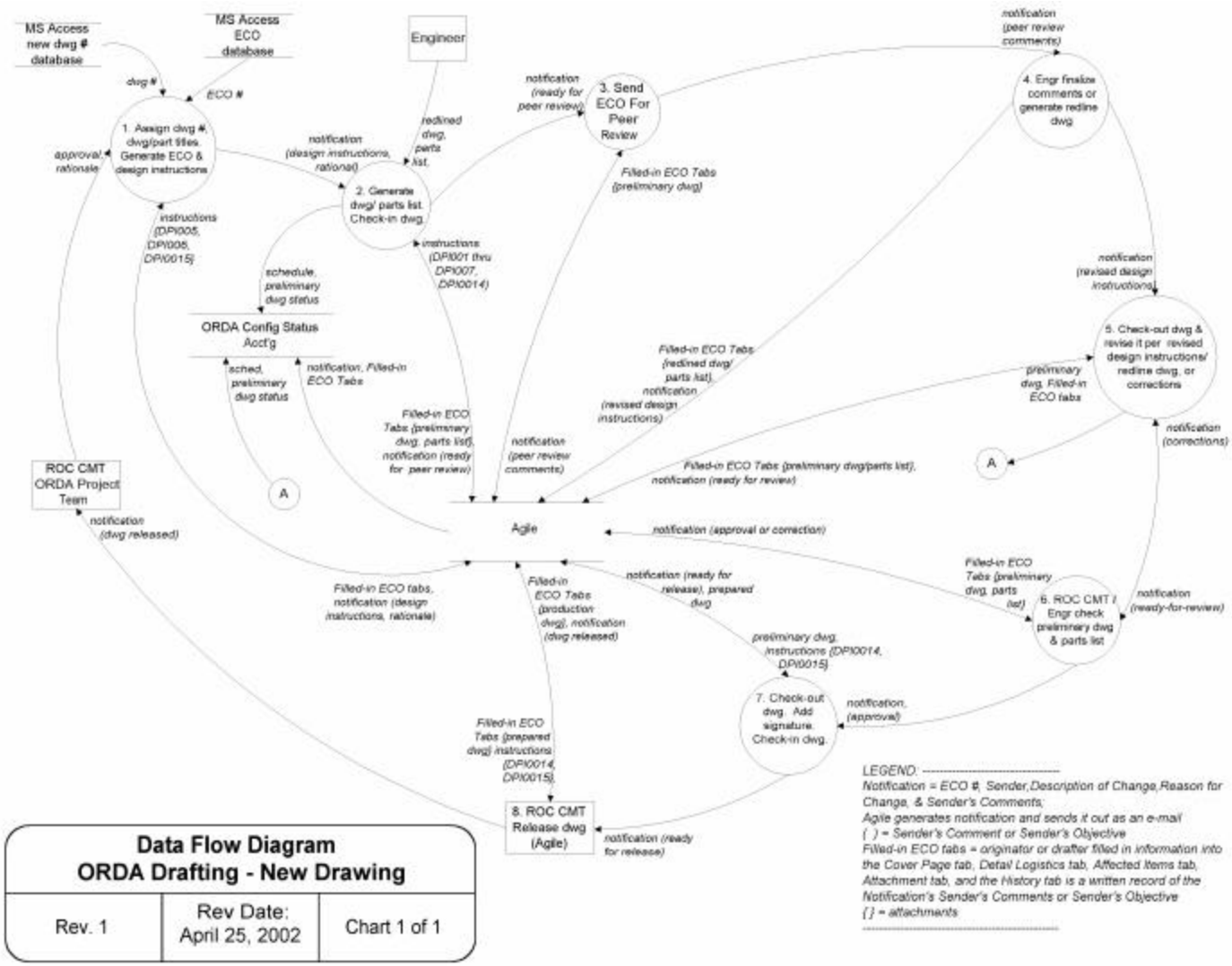


Figure 6. ORDA Drafting data flow diagram for new drawings.

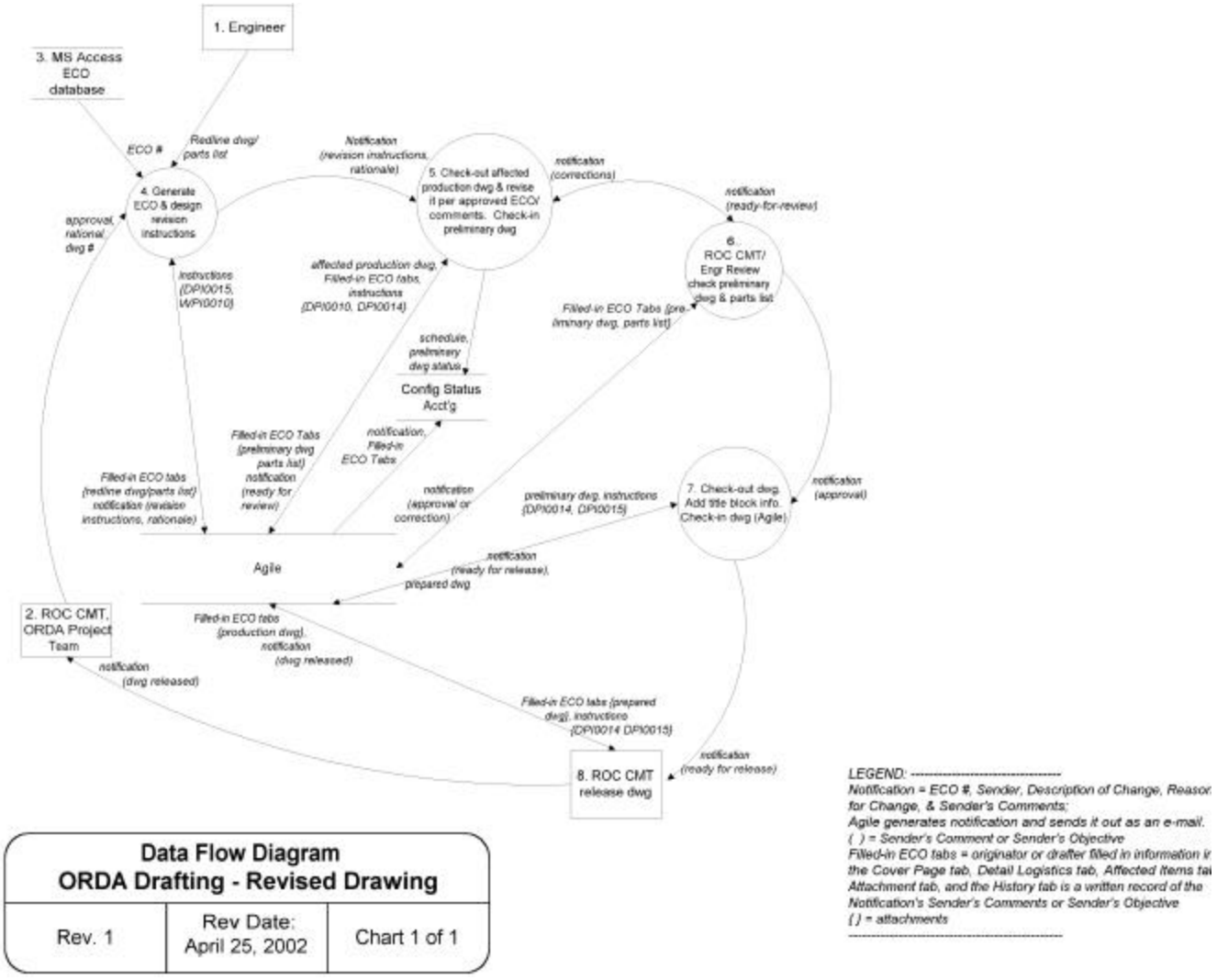


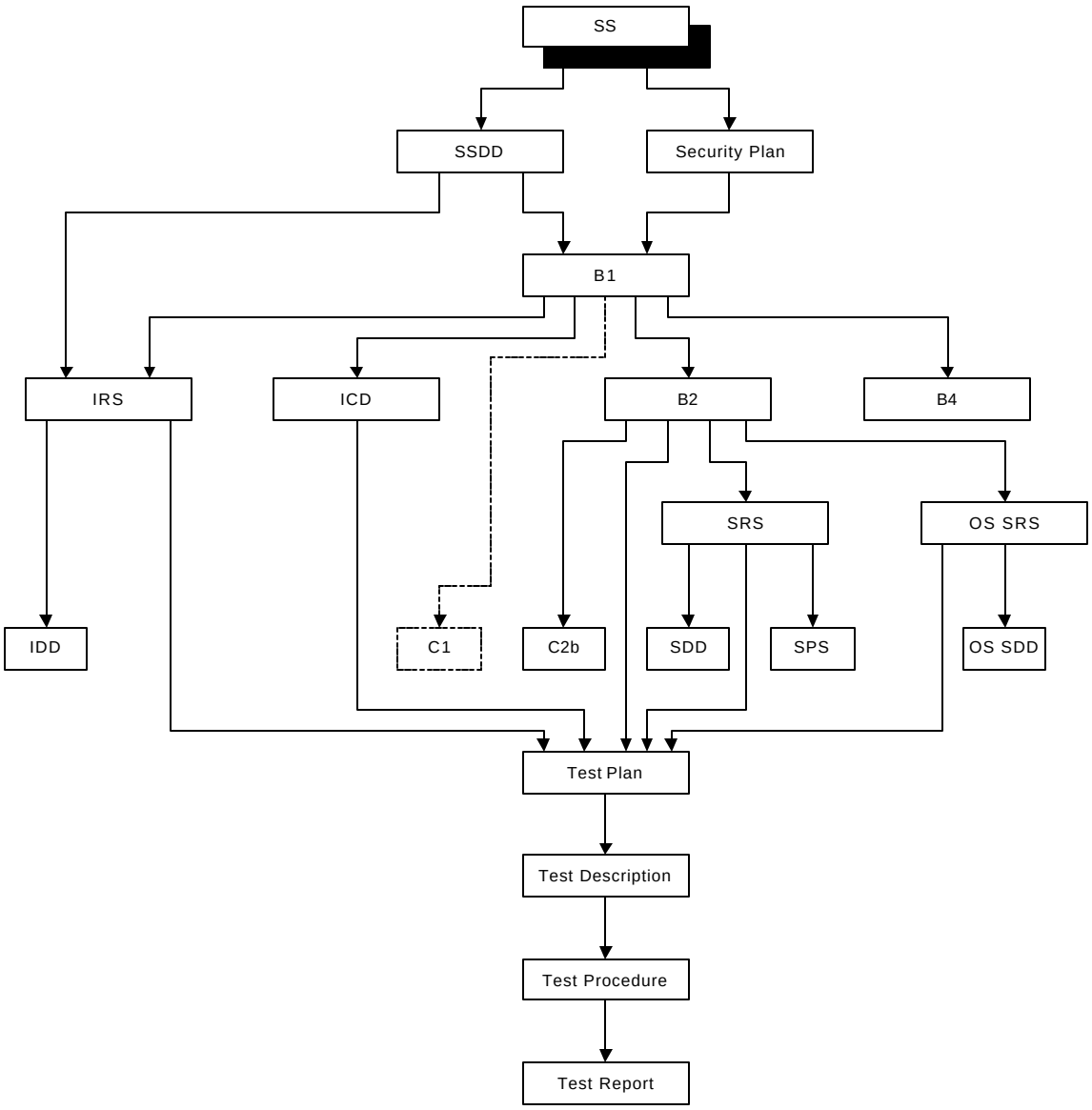
Figure 7. ORDA Drafting data flow diagram for revising drawings.

Section 10 - Configuration Audits

The ORDA Project's configuration management's final objective is to fulfill the requirements for Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) to be conducted by the Government. RSIS will provide agendas before the FCA and PCA and minutes after the FCA and PCA. Periodic internal audits will be used to track ORDA configuration management progress and overall project progress.

Subordinate Performing Activity and Vendor Control

Contractor-to-Vendor interface will be established by a Government-reviewed Vendor Work Breakdown Structure or Vendor Statement of Work. All configuration change proposals will be processed according to this plan.



ORDA Requirements Traceability		
	4/24/02	From ORDA System Development Plan